

# **FITTED BEDDING**

## **Cross Reference to Related Applications**

This is a non-provisional application based on U.S. provisional patent application serial no. 60/401,177, entitled "FITTED BEDDING", filed August 5, 2002.

## **BACKGROUND OF THE INVENTION**

### **1. Field of the invention.**

The present invention relates to bedding, and, more particularly, to fitted bedding in the form of a fitted lower sheet.

### **2. Description of the related art.**

Fitted bed sheets and mattress covers are well known, for example it is known for a fitted bed sheet to have an end pocket to receive an end of a mattress and hooks and eyes to secure the bottom of the pocket to the mattress. Other examples are mattress covers with elastic straps across the corners fitting underneath a mattress. And in a similar fashion mattress covers having elastic edges that fit under the mattress. Methods for production of fitted sheets are known, for example, as in U.S. Patent No. 4,932,344 where a method and apparatus is disclosed to fabricate fitted bedding covers from a generally rectangular blank textile material, which accommodates mattress corners and allows for the application of elastic to selected portions of the cover.

U.S. Patent 3,694,832 discloses a fitted bed sheet prepared from a rectangular blank of textile material including the cutting of V-shaped portions from the rectangular sheet.

Often what is done to hold a fitted mattress cover or sheet onto a bed is to utilize an elastic system or other mechanical devices to hold the bedding on the mattress. The elastic systems degrade through multiple washings. Mechanical devices break, bend and separate from sheets as they are handled and laundered.

What is needed in the art is a method to hold fitted bedding onto a mattress that is as durable as the bedding itself.

### **SUMMARY OF THE INVENTION**

The present invention provides a fitted sheet for use in domestic and institutional settings.

The invention comprises, in one form thereof, a fitted sheet including a top rectangular fabric portion having at least four edges, at least two side rectangular fabric portions including a first side rectangular fabric portion and a second side rectangular fabric portion, each of the at least two side rectangular fabric portions including a first edge, a second edge and a third edge, the first edge of the at least two side rectangular fabric portions being common with a corresponding one of the at least four edges, the second edge of the first side rectangular fabric portion being common with the second edge of the second side rectangular fabric portion and at least one triangular fabric portion including a first edge, a second edge and a third edge, the first edge of the at least one triangular fabric portion being joined to a portion of the third edge of the first rectangular fabric portion and the second edge of the at least one triangular fabric portion being joined to a portion of the third edge of the second rectangular fabric portion.

The present invention advantageously utilizes the same fabric as a sheet to hold the sheet to the mattress.

Another advantage of the present invention is that the sheet corner inserts have a natural flexibility along a diagonal to enhance the insulation of the fitted bedding on a mattress.

Still another advantage of the present invention is that the fitted sheet will accommodate a variable height mattress utilized in institutionalized settings.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

The above-mentioned and other features and advantages of this invention, and the manner of attaining them, will become more apparent and the invention will be better understood by reference to the following description of embodiments of the invention taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a perspective view of an embodiment of a fitted sheet shown upside down to illustrate the features of the present invention;

Fig. 2 is a detailed drawing of one of the corners of the fitted sheet of Fig. 1;

Fig. 3 is a close up view of one corner of an alternate embodiment of the present invention to accommodate an air fill tube of a mattress;

Fig. 4 is another view of the corner insert of the present invention shown in Fig. 3; and

Fig. 5 is a view of a cut unseamed sheet portion of the fitted sheet of Figs. 1 and 2.

Corresponding reference characters indicate corresponding parts throughout the several views. The exemplifications set out herein illustrate one preferred embodiment of the invention, in one form, and such exemplifications are not to be construed as limiting the scope of the invention in any manner.

## **DETAILED DESCRIPTION OF THE INVENTION**

Referring now to the drawings, and more particularly to Fig. 1, there is shown a fitted bed sheet 10 including top portion 12, side sections 14, 16, 18 and 20, corner inserts 22, 24, 26 and 28 and turned-under edge 30. Top portion 12 and side portions 14, 16, 18 and 20 can be formed from a single piece of cloth that starts as a substantially rectangular shape. Substantially square shaped portions are removed from the corners of the rectangular cloth and corners 32 are formed by seaming the edges left after the removal of the square shaped portions. Corner inserts 22, 24,

26 and 28 are sewn to either an edge of corresponding side portion 14, 16, 18 or 20 or to an edge of turned-under portion 30. Any unseamed edge of fitted sheet 10 is appropriately hemmed.

When fitted sheet 10 is installed on a mattress, top portion 12 covers the top of the mattress and side portions 14, 16, 18 and 20 cover the sides of the mattress. Turned-under edge 30 extends a short distance under the edge of the mattress to both assist in the retaining of fitted sheet 10 of the mattress and to provide an aesthetically pleasing look. Corner inserts 22, 24, 26 and 28 advantageously retain fitted sheet 10 on the mattress.

Now, additionally referring to Fig. 2, a corner insert such as corner insert 22 is shown as a triangular shape. Schematically illustrated on corner insert 22 is a fiber orientation 34 which illustrates that the fibers of the fabric run generally parallel and perpendicular to the sides of fitted sheet 10.

Insert 22 has three sides 36, 38 and 40. Side 36 runs along the length of fitted sheet 10, side 38 runs along the width of fitted sheet 10 and side 40, which is a hypotenuse of the triangle, runs angularly from side 20 to side 14. Since side 40 runs at an angle and therefore cuts across the fiber orientation 34 at an angle, corner insert 22 is cut on what is described as the bias. This advantageously allows more flexing in the material thereby allowing for ease in installation and removal of fitted bedding 10. Along the edge side 40 a serge stitch is utilized to allow expansion and retraction of side 40. Angle A on corner insert 22 while shown at a 90 degree angle may vary therefrom. Angle A is selected from a range of 70 to 90 degrees to thereby alter the tension which corner insert 22 will apply to sides 14 and 20.

Now, additionally referring to Fig. 5, there is shown an unstitched sheet 42 illustrating portions 12, 14, 16, 18 and 20 and turn-under portion 30, along with square 44. As stated above, top portion 12 and sides 14, 16, 18 and 20 and turned-under edge 30 can be an integral piece of

cloth, which starts as a rectangle. The dimensions of the sides of the original rectangular piece of fabric are calculated using the following formulas:

Width of fabric = width of mattress + (2 x height of mattress) + (2 x turn-under)

Length of fabric = length of mattress + (2 x height of mattress) + (2 x turn-under)

The size of square corners 44 cut from the rectangular piece of fabric is calculated in the following manner:

Length of a side of square 44 = height of mattress + turn-under – seam allowance

Where the seam allowance normally is in the range of from  $\frac{1}{4}$  inch to  $\frac{3}{4}$  inch.

Example: A 6 inch high mattress plus 2.5 inch turn-under 30 minus .5 inch seam allowance equals an 8 inch square 44 to be cut from each corner.

The length of side 38 is selected to be approximately 10 to 35 percent of the width of fabric as calculated above for the original rectangle. Preferably side 38 will be between approximately 22 and 32 percent of the width of the fabric as calculated above. In a like manner side 36 may vary between 10 and 35 percent of the length of fabric as calculated above and preferably between 22 and 32 percent of the length of fabric as calculated above. Turned-under edge 30 is normally between 1 and 4 inches for each side of the mattress and preferably between two and two and a half inches. All edges of fitted sheet 10 are finished with a hem by either serging or stitching a narrow hem. These serve as an anti-fraying type stitch along an edge that is not coupled with another piece of material.

Although corner insert 22 has been discussed at length, it is understood that the same features exist in corner inserts 24, 26 and 28. It is the sizing and shape of corner inserts 22, 24, 26 and 28 that advantageously retain fitted sheet 10 upon the mattress in a desirable way.

Now, additionally referring to Figs. 3 and 4, there is shown an alternate corner insert 50 on the corner of a fitted sheet 10. Corner insert 50 includes an opening 52, a first insert portion 54, a second insert portion 56, a fastener system 58 and 60. Opening 52 is positioned to accommodate an air hose connected from an air control device (not shown) to a mattress that expands and deflates to assist a patient and to prevent the patient from getting bed sores. The calculation for obtaining the dimensions for the original rectangle, from which to manufacture fitted sheet 10, is modified to include the additional height that such a mattress obtains. Alternatively, an additionally eight to ten inches is added to the width measurements and also an additional four to ten inches to the length measurement. Both of these are multiplied by 2 since they accommodate the height of the mattress. Additionally, the extra fabric adds to the comfort of the patient. Although one corner insert can be deleted to accommodate the hose of the air mattress, the preferred solution is shown in Figs. 3 and 4. Fastening system 58 and 60 is pulled apart to allow the insertion of the air hose (not shown). Fastening system 58 and 60 may for example be loop 58 and hook 60 of a Velcro<sup>TM</sup> system.

Advantageously the present invention utilizes the same fabric for corner inserts 22, 24, 26, 28 and 50 to provide similar life and wear characteristics as the rest of fitted sheet 10. The resiliency of inserts 22, 24, 26, 28 and 50 match the rest of fitted sheet 10 and typically do not degrade in the laundering process as portions of sheets that have rubber or synthetic elastic mechanism attached to the corners of sheets. The institutional use of fitted sheet 10 has shown the durability of this design with multiple washings resulting in a matched durability of corner inserts 22, 24, 26, 28 and 50 with the rest of the sheet.

To manufacture fitted sheet 10 a rectangular piece of fabric sized according to the above discussed formulas is selected. A square 44 from each corner of the rectangular piece of fabric is removed and the material along the edge of the removed square is joined together by a sewing

operation. Corner inserts 22, 24, 26, 28 and 50, being triangular in nature, may then be produced from smaller rectangular pieces of material sized in accordance with the above-discussed dimensions. The corner inserts 22, 24, 26, 28 and 50 are then sewn in place, thereby producing fitted sheet 10.

While this invention has been described as having a preferred design, the present invention can be further modified within the spirit and scope of this disclosure. This application is therefore intended to cover any variations, uses, or adaptations of the invention using its general principles. Further, this application is intended to cover such departures from the present disclosure as come within known or customary practice in the art to which this invention pertains and which fall within the limits of the appended claims.